

THE UNDERGRADUATE STUDENTS' COLLEGE-CHOICE
DECISION: AN EMPIRICAL STUDY

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TABLE OF CONTENTS

	Page
ACKNOWLEDGMENTS	ii
LIST OF TABLES	v
SUMMARY	vi
Chapter	
I. INTRODUCTION	1
The Purpose of the Study	
The Approach Taken	
II. EXPECTANCY MODELS	5
The History of Expectancy Models	
Vroom's Model	
The Model Applied	
College Choice Literature	
The Research Question	
III. STUDY DESIGN	52
Goal Identification	
Questionnaire Development	
The Sample Group	
Administration and Processing of the Questionnaire	
IV. RESULTS	58
Analyses of the Data	
Background Survey of Applicants	
Preliminary Analyses	
Tests of the Models	
Results of the Models	
V. CONCLUSIONS AND RECOMMENDATIONS	66
Discussion and Conclusions	
Recommendations	

TABLE OF CONTENTS (Continued)

	Page
APPENDICES	70
BIBLIOGRAPHY	81

LIST OF TABLES

Table	Page
1. Summary of Expectancy Literature	31
2. Results of the Model Tests	64

SUMMARY

The undergraduate student's decision as to which college to attend is studied using two simple expectancy-type models. The area of study is of interest for two reasons: first because of the importance of the college-choice decision to individuals, colleges, and society; and second because of an interest in furthering the state of knowledge of expectancy theory.

A literature review and a discussion of expectancy led to the discussion of the present work. The research question asked is: "What is the predictive efficiency of simple expectancy models in the college-choice decision environment?" To answer the question, the variables thought to be relevant to the specific decision were assembled into a questionnaire for gathering data, and two models were chosen for testing. The questionnaire was mailed to the students who had applied for admission into the freshman class of the Georgia Institute of Technology. Most had been accepted for admission, and at the time of administration, most had definitely decided which college they would attend. They were given a list of twenty-three factors to rate on importance to them, yielding the Valence (V) values. The subjects next rated the same list of twenty-three items on what they thought the probability of obtaining the outcome was if they chose Georgia Tech. This is

the Instrumentality (I_T) value for Georgia Tech, and the Instrumentality value for the other college in the decision (I_O) was found by rating the same list of items upon the probability of getting each factor by choosing that other school.

The models yield a success if the "score", called the Force (F), for one school is greater than that of the other and that college with the higher F value is the one selected for attendance. For the first model, the value of F is a summation of the products of V and I . The second approach computes F by summing the I values for an unweighted sum. Both models predict actual choice at significantly greater than chance levels.

In addition to the tests using the list of twenty-three goal states, the same models were used with a reduced number of factors. These factors were generated from the complete list because of a cluster pattern with certain items correlating highly with others. The results here, too, are supportive of the models.

The findings are supportive of expectancy theory and give some insight into how the college-choice decision takes place.

CHAPTER I

INTRODUCTION

The decision of each individual student as to his choice of college is of utmost importance both to the person and to society, since the choice made affects his future and that of society. It is of national concern what use is made of the potential of its youth, and indications point to a lack of the highly trained people necessary to maintain the current rate of advancement that is being experienced at all levels (cultural, scientific, and economic) in the United States. This shortage is more acute in the technical fields. The Manpower Report to the President by the U. S. Department of Labor, as far in the past as 1964, was predicting this phenomenon, especially in mathematics and the sciences. The shortage of engineers in the latter half of the 1970's has been predicted to be from bad to critical, as is described in a passage from the Wall Street Journal:

There is almost universal agreement that engineer shortages will worsen and become chronic in the years ahead. A Labor Department projection indicates a severe pinch around 1980, when the assumed lack of interest among students will be compounded by a decline in the college-age population coinciding with retirement of many engineers who began their careers in the early 1950's... The tightening supply of engineers threatens the success of efforts in productivity, energy, pollution, and industrial health and safety.

In addition to the concern of both the student and society with the choice of college, the individual institutions chosen (or not chosen) are deeply affected by this college-choice decision. The Georgia Institute of Technology, for example, as a major institution educating engineers and scientists, is interested in knowing why its students are attending. Encouraging academically able high school students to attend an institution of higher education for training in a technical discipline has become one of the functions and responsibilities of such institutions. Of perhaps greater importance than knowing why students attend is knowing why potential students do not matriculate.

The Purpose of the Study

The purpose of this study was to learn if and how the outcome of the college-choice decision can be predicted if it is known what an individual is looking for in a school and what he thinks that his chances are for getting what he is looking for at each college that he is considering. Information gained in this study has the dual purpose of testing decision models to see whether they are verified by an empirical study, and to provide the institution with additional knowledge of what is in the minds of students when they are choosing a college. Knowing what individuals are looking for in a school is useful to it, and even more valuable is the capability of the school to dispel misconceptions that would have led to an unfavorable decision for the college.

The Approach Taken

The college-choice decision, then, is of great interest at the individual, institutional, and national levels. However, most research that has been published is concerned with the antecedent factors influencing the decision and not with the mechanics of the decision process itself. Taking a predominately sociological approach, most published studies in this area relate such variables as demographic backgrounds, academic abilities, personal backgrounds, and preferences to the dependent variables of college-choice. Since little attention has been given to the mechanics of the college-choice decision, a major thrust of the present study is the examination of these decision dynamics from the perspective of expectancy models.

Expectancy models are explored and discussed in the first section of Chapter II. The second section reviews published studies both of the college-going decision (the decision whether or not to go to college) and with the subsequent selection of the school, the college-choice decision.

The empirical data reported here were collected by a questionnaire that was sent to every applicant whose application had been processed for admission into the 1974 fall quarter freshman class at the Georgia Institute of Technology. The instrument was designed to measure what is important to the student, and then to what extent he expects to find these factors at the schools included in his decision. The develop-

ment of the questionnaire and the study design comprise Chapter III. Data analyses and tests of various expectancy-type models are presented in Chapter IV, while conclusions and recommendations are Chapter V.

CHAPTER II

EXPECTANCY MODELS

The History of Expectancy Models

Expectancy models are currently attracting considerable research attention in a number of behavioral areas. The basic ideas are not new, being deeply rooted in the concept of hedonism, the idea that a person seeks to maximize his pleasure and to minimize his pain. Formal treatments of expectancy may be traced to the efforts of seventeenth century economists and mathematicians to determine expected values (EV) for gambles, where expected value is defined as the product of the value of a payoff and its probability of occurrence. Rationality is normatively defined in terms of the maximization of expected value.

Observations of actual choice behavior have generally not supported the descriptive adequacy of the expected value model. The model was modified, first, to consider expected utility (EU), where the objective value of a payoff is replaced by its subjective value (or utility), and second, to consider the individual's beliefs as to the relative likelihood of different outcomes (subjective probabilities) rather than the objective probabilities. The development of these ideas, and their relationship to Bayesian statistics and the work of Savage (1954), is well reviewed by Edwards (1954),

himself a major contributor to the subsequent development of the subjective expected utility (SEU) model.

All three decision-making models, EV, EU, and SEU, are based on the same two concepts. They are: (1) the idea that people choose the "best" alternative that they perceive, and (2) the principle that mathematical expectation is used as the measure of best. Models of this type have been reasonably successful in overall predictions of choices in gambling situations. (Edwards, 1954, 1961; Payne, 1973; Mosteller and Nogee, 1951).

Vroom's Model

SEU-type models have been used in a variety of choice situations, particularly in a form proposed by Vroom (1964). What Vroom has proposed is similar to concepts developed by Tolman (1932) and Lewin (1938). He said the outcome of an individual's decision is the result of the person deciding what outcomes are important to him and then what he thinks his chances are of getting the outcomes that are desirable if he makes some particular selection. Vroom suggested a two stage process, where the first step (Proposition I) is a relationship between the importance of particular outcomes and their expected consequences, and the second expresses the relationship between the importance of the outcome and the subjective probability that choosing a particular alternative will lead to that outcome.

Vroom's formulation is based on three concepts: valence, instrumentality, and expectancy. The first is defined as:

Valence: affective orientation toward particular outcomes.

An outcome has positive valence to the individual if he prefers attainment to non-attainment, that is, when the decision-maker prefers getting some outcome X to not getting X. An outcome has zero valence when the individual is indifferent to whether or not he gets X, and an outcome is negatively valent when he prefers non-attainment. Valence, is thus, anticipated satisfaction (or dissatisfaction) rather than the actual satisfaction. Therefore, it follows that means acquire valence according to the expected relationship to ends. This linkage belief between one outcome and another is termed an instrumentality belief, and is defined:

Instrumentality: the subjective probability seen by the decision-maker between one outcome as leading to another outcome.

Instrumentality is an outcome-outcome association that takes on values ranging from negative one to positive one. The negative one indicates that the individual believes that the second outcome is certain if the first outcome does not occur and is impossible if it does. The positive one indicates that the first outcome's occurrence is believed to assure that of the second. Vroom's formulated relationship between the valence of outcomes and their expected instrumentalities

is written as:

$$\text{Proposition I: } V_j = f \sum_k V_k I_{jk} \quad (j = 1, 2, \dots, n)$$

$$f > 0; \quad i I_{ij} = 0$$

where: V_j = the valence of outcome j

I_{jk} = the cognized instrumentality of outcome j for the attainment of outcome k . $(-1 \leq I_{jk} \leq 1)$

Vroom took his theory further to predict the behavior of the decision-maker with regard to an outcome. He presented another term to do this.

Expectancy: a momentary belief concerning the likelihood that a particular act will be followed by a particular outcome.

The individual's expectancy is his belief that if he performs a certain act, then a particular outcome will be the result. The values range from zero to one, where zero indicates a belief that the act will not be followed by the outcome. The behavior is assumed to be the result of a field of forces on the individual. Proposition II expresses the relationship between the valences and expectancies. This relationship is expressed as a monotonically increasing function:

$$\text{Proposition II: } F_i = \sum (E_{ij} V_j) \quad (i = n+1, \dots, m)$$

where: F_i = the force to perform act i

E_{ij} = the strength of the expectancy that act i will be followed by outcome J .
 $(0 \leq E_{ij} \leq 1)$

V_j = the valence of outcome j .

The assumption is made that people choose the alternative action that corresponds to the strongest positive (or weakest negative) force. Proposition II is different from Proposition I because it predicts behavior, while Proposition I predicts valence of events which are unlikely to be under behavioral control.

In the college-choice decision studied here, respondents had already been accepted at a minimum of two colleges. Thus, it is assumed here that the instrumentalities for both colleges are unity. For example, the student who selects College A will go to A, and the one who selects College B will go to B. The interest here is in the prediction of the actual choice, using Proposition II.

The Model Applied

Vroom's model has been very popular in the past decade and has been put to use in a number of situations. The majority of the research projects studied motivation, satisfaction, and job performance. Certain studies of this category will be covered in the next section to show how the model is applicable to situations other than organizational choice situations. Work productivity was the first variable to come under scrutiny. Of historical importance, is a study by Georgopoulos, Mahoney, and Jones (1957) which preceded Vroom's publication by seven years. They were interested in why some people tend

to be high in production and why workers of similar backgrounds in similar activities under comparable conditions vary in output. They took a path-goal approach where production was assumed to be a function of one's motivation to produce at a certain level, and that such motivation depends on the needs of the individual and his perception of the instrumentality (path to attainment of goals) of that production level. They surveyed 621 employees in a household appliances company. Four hypotheses were tested: (1) The percentage of high producers is greater among workers with high path-goal perceptions. (2) The percent difference of high producers having positive path-goal perceptions and those having negative path-goal perceptions is greater than among workers having a high need than those with the low need for the same goal. (3) The path-goal hypothesis holds better under conditions of freedom for the workers. (4) The path-goal hypothesis holds best for workers having high needs and who are free from barriers. All four hypotheses were supported from the data. Although this study preceded Vroom's model, it parallels his formulations. Vroom's instrumentality is comparable to the object of the path-goal perception, which is the level of production. The valence is the importance of high production and the expected consequences of such performance to the individual.

Galbraith and Cummings (1967) also wanted to explain the differences in productivity among workers. They applied

the expectancy model to their study of thirty-two operatives in a heavy-equipment manufacturing company. They used productivity as a first level outcome, and rewards from the organization (increase in salary, promotion, and benefits) as second level outcomes. They devised a questionnaire measuring the valence of both levels of outcomes, the instrumentality of working hard leading to high productivity, and the expectations of high productivity leading to these outcomes. The information gained from the workers on the questionnaire, when fitted into Vroom's model, proved to correlate highly with the actual production rates of the individuals. This is supportive of Vroom's theory.

Hackman and Porter (1968) wanted to be able to predict work effectiveness. They surveyed eight-two female service representatives in three comparably sized offices of the telephone company, using a questionnaire to obtain measures of the expectancy of getting outcomes from working hard and valences of the values of the outcomes to the individual women. Vroom's multiplicative relationship was used to get a performance predictor. These calculated performance predictors were compared with data on actual performance for each subject. The values of actual performance and of the calculated predictors have a statistically significant correlation. The expectancy method showed to be a strong predictor of performance in comparison to other methods using attitudes. Managerial performance came under Lawler and Porter's (1967) scru-

tiny as they tried to relate performance to attitudes. The subjects were 154 managers from five organizations who ranged in status from foreman to company president. They were surveyed to find the value of certain rewards to them and the subjective probabilities that these rewards depend upon effort and that performance depends upon effort. Indices of effort were obtained on each subject using the gained information. The model was supported by the correlation of the results of the indices and actual performance data on each individual. High correlation was found for how they ranked their own behavior and for what they ranked to be important factors for success. This supported the hypothesis that the amount of effort expended serves as a moderator of the relationship between role perception and job performance. This is because the effort expended influences the effectiveness of the performance. The same findings were found in their study of fifty-five administrators in social welfare organizations. Composite indices were computed for each subject using Vroom's multiplicative relationship between valence and expectancy. Again, a high correlation was found between how the subjects ranked what they considered to be important for success and how they ranked their own behavior.

Lawler (1968) followed this up with a study of the correlational-causal relationships between expectancy attitudes and job performance. He surveyed the same fifty-five social service managers on the same variables one year later. Again,

he asked them to fill out a questionnaire that reflected expectancy attitudes that lead to performance and the values of job-related outcomes. He hypothesized that expectancy attitudes lead to performance, rather than the reverse where performance leads to expectancy attitudes. Cross-lagged analysis showed attitudes at time t_1 to better predict performance at t_2 than did performance at t_1 predict attitudes at t_2 in three trials. Again, Lawler found support for Vroom's theory, although he modified the original concept of force, which is beyond the control of the individual, to that of effort, which is behaviorally controlled.

Jorgenson, Dunnette, and Pritchard (1973) manipulated performance-reward conditions in a simulated work setting to find the effects on behavior. They used 256 undergraduate males to find prices in a mail-order catalog and to transfer the prices to a work sheet. Two pay conditions were established, an incentive situation and an hourly rate pay-method. The researchers hypothesized that the subjects in the incentive group when shifted to the hourly-pay group would decrease effort and their performance levels would drop, while those in the hourly group would increase their efforts and performance levels when moved to the incentive plan. From a questionnaire measuring expectancy and valence of pay to performance, the values showed that the expectancy value indicated the performance level better than did the valence. The results are thus partially supportive of expectancy theory.

Pritchard and Sanders (1973) ran a study on Post Office employees in a mail sorting training program. They were seeking to find the influence of valence, instrumentality, and expectancy on effort and performance. They had each subject complete a questionnaire that asked questions measuring the three variables, valence, instrumentality, and expectancy, and then compared the results with performance reports from the individuals' supervisors and peers. The results showed the single best predictor to be the valence (V) value alone. $(V+I)$, where I is the instrumentality value, showed lower predictive ability than did $(V \times I)$, yet neither did as well as V alone. This is not in agreement with the findings of Jorgenson et al. that showed expectancy to be the best single predictor. The findings, however, did uphold the predictions using all three measures. Pritchard and DeLeo (1973) ran a study to test the multiplicative relationship between the valence of job outcomes and the performance-outcome instrumentality. The sixty subjects performed the same task as in the case studied by Jorgenson, et al., the task of transferring prices from a catalog to an order form in a simulated work atmosphere. They measured the valence of the job outcomes and the instrumentalities of performance for attaining the outcomes. Performance predictions were made using this data, but the values obtained through the calculations did not correlate highly with actual performance, and thus did not support the theory. No support was found for any kind of inter-

action between valence and instrumentality.

Expectancy theory as an indicator of job performance and behavior is investigated by Sheridan, Slocum, and Richards (1974) in their research done on nursing school graduates. The forty-nine subjects were surveyed over a period of fifteen months to find the relationships between performance, job satisfaction, and their valences and instrumentalities for the work outcomes (rewards and benefits). Data were gathered from questionnaires administered immediately after the graduation of the women and again fifteen months later after each had experienced that many months on the job. The second administration served as a test of the predictions made by Sheridan, et al., from the first questionnaire. Correlation data indicated that the expectancy model had higher concurrent validity than predictive validity for explaining both performance and satisfaction. Expectancy theory was found here not to be a predictor, but at best only a means of explaining current attitudes.

Motivation has historically been of interest to researchers investigating job performance and effectiveness. Some investigators using expectancy theory have also chosen to take the concept of motivation into consideration in their studies. Four studies will be discussed to illustrate how this concept is included in expectancy-based studies of job performance. Goodman, Rose, and Furcon (1970) studied motivational antecedents on the work performance of scientists and

engineers. The subjects were seventy-eight volunteers from a government research laboratory. Four approaches were taken in the study. The first tried to predict performance based on preferred career goals, the second on the preferred sources of stimulus for work, the third on job dedication, and the fourth was an expectancy model. The hypothesis was that the expectancy model would show the strongest association with performance because it includes more multidimensional specifications of motivation, and its operational measures are more specific to the criteria of the variables than are those of the other three models. They measured an incentive value (used in the place of valence in the model) and the expectancy that a certain level of performance would lead to particular work outcomes. The resulting index for each subject was called the motivational index. Correlations with actual performance of the scientists and engineers showed the motivation index computed with the expectancy model to be higher than were the indices derived using the other three models. The results showed the expectancy model to be the best predictor of performance of the four approaches. Cohen and Turney (1973) used expectancy models to study motivation and performance in the U. S. Army. They wanted to demonstrate the impact of situational restrictions on motivation on the performance of specific jobs in a military work setting. All subjects were enlisted Army personnel working in a complex communications system that required skill and training. Expec-

tancy values were found for each subject on perceived control over their own job behavior. Valence values were also found for demonstrating how important self-control was to each individual. Vroom's ($E \times V$) was used to obtain a value that the researchers called a motivator for each subject. Correlations were found between this value and the actual performance records for each soldier, and the findings were positive and supportive of the theory.

Another success for the model was from a study by Wofford (1971) on the motivational bases of job satisfaction and job performance on non-managerial workers. The subjects were fifty-eight employees of an airplane parts manufacturing company, a petroleum manufacturing and distributing firm, a medical laboratory, and a warehousing company. He gathered data for each subject through a questionnaire on the strength of work-related needs and the expectancy that effective performance would lead to the gratification of these needs. Performance ratings correlated higher with the findings from the model for job satisfaction than did the predictions for job performance, although the model was effective for predicting both. Wofford took the same data and tested it with Maslow's five levels of needs and Herzberg's two levels. The data did not support Herzberg's theory and did not support Maslow's contention that the upper level needs can only be met after the lower levels have been satisfied. Wofford found that the higher needs could be satisfied when the lower ones were left

unsatisfied. Therefore, expectancy theory showed more promise for understanding and predicting job motivation and satisfaction than did either of the other two approaches.

Graen (1969) also studied work motivation using expectancy theory. Like Lawler, he transposed Vroom's concept of force to that of effort to make his study. He created three work environments based on pay methods (pay contingent upon effective performance, pay as an inducement to effective performance, and a control condition where neither of the two previously mentioned methods were used) for his experiments. He tested 169 women clerical workers under the three sets of conditions for their perceptions of work roles and the relation to role outcomes. He questioned each subject to learn her feelings about her work role and her estimation that her role performance will lead to certain job outcomes. Graen used Vroom's multiplicative relationship to combine these two variables to get a value for the probability of high performance for each subject. The data supported the hypothesis that the changes in effort and satisfaction can be predicted for a worker when these changes are a consequence of being rewarded on a particular contingency basis, that is when it is known under what condition pay is based. However, no support was found for a hypothesis predicting job performance. Graen points out that had he not established the three pay methods as boundary conditions, his results would not have supported the model. He followed with the suggestion that

before a similar study is made, the researcher should take into consideration the pay methods or particular performance criteria and then have some method of comparison between such methods so that he can see distinctions that may indicate support (or a lack thereof) for expectancy theory.

Lawler studied the effects of wages (1967) and ability (1966) in the relationship between job attitudes and performance. In studying how ability enters into the relationship, he drew from Vroom (1964) the idea that performance is a function of the product of ability and motivation. He surveyed 211 middle and low-level government employees from three states. He wanted to see if ability served as a moderator between attitudes and performance. He had each subject rate what he considered to be important in performing his job, and then to rate how he thinks that he performs the job. This information was correlated with performance ratings on each individual by his supervisor and his peers. The subject and his supervisor and peers were to indicate ability in their responses, which was a problem because all three groups tended not to be able to distinguish between ability and performance. The findings revealed that the relationship between attitudes and job performance may show an underestimate of the strength of the tie between the two factors if ability is not considered. Lawler and Porter (1968) continued this idea in their work related to the influence of role perceptions, previously fulfilled rewards, and how equitably the rewards

are perceived to be. Lawler (1967) took a look at pay as related to organizational effectiveness and work performance through a literature search rather than through a field or lab study. He cites seven writers: Tolman (1932), Lewin (1938), Atkinson (1958), Edwards (1954), Peak (1955), Rotter (1954, 1955), and Vroom (1964). His findings showed that:

- (1) Organizations paying higher than average wages seem to be best able to attract and retain high-quality labor.
- (2) Turnover is higher in organizations with low wages in relation to the other organizations in the area.
- (3) The stimulus to leave the organization is greatest when employees in other organizations appear to make higher wages.
- (4) The turnover rate is low during a recession or depression.

The first three of these findings indicate that people choose jobs perceived to have the highest instrumentalities for one goal, pay. Lawler suggests that these four findings are useful in predicting how workers will behave under these conditions. Schwab (1973) studied the impact of alternative methods of compensation on the perceptions of an individual on pay valence and instrumentality. The pay methods were on an hourly basis, on piece-rate basis, and on group incentive. The subjects were 273 employees in a large consumer goods manufacturing operation. Questionnaires were completed by each subject to provide the information on the valence of pay and the instrumentality of performance attaining a change in level of pay. Schwab hypothesized that the perceived instrumentality

of performance for attainment of pay scores would be highest for employees on the piece-rate plan, then the group incentive, and lowest for those paid by the hour. The data provided significant support for this, and thus supported the theory.

Because Vroom's model of expectancy has become so widely used, it follows that a number of modifications would be investigated. It has already been mentioned that Lawler and Graen both used the concept of effort rather than that of force. Still other changes have been made or proposed. Lawler and Suttle (1973) tested seven conceptually different variables from the models in causal relationships between expectancy attitudes and motivation. They are: (1) Effort leading to Outcome: a measure of the degree effort is seen to result in an outcome. (2) Effort leading to Outcome weighted multiplicatively by the valence: a measure of force (motivation) computed as a sum or average of the expectancy of effort leading to the outcome multiplied by the value of the valence. (3) Effort leading to Performance: a measure of the belief that effort leads to good performance. (4) Performance leading to Outcome: a measure of the expectancy, computed as the sum of the beliefs linking performance with first level outcomes. (5) Performance leading to Outcome weighted multiplicatively by the valence: a measure of the expectancy, computed as the sum of beliefs linking performance with first level outcomes, weighted multiplicatively by the valence value.

(6) Instrumentality multiplied by the expectancy value: computed as the product of Effort leading to Performance and Performance leading to the Outcome. (7) The product of Effort leading to Performance and Performance leading to Outcome and Valence: a measure of the concept of motivation. The models were tested in a study conducted using sixty-nine managers from six retail stores. Each subject completed a questionnaire that measured three attitude variables: Effort leading to Performance, Performance leading to Outcomes, and Effort leading to Outcomes. These data provided subjective performance ratings and sales records provided objective ratings. Correlations were made between the two performance values for each subject which showed mixed support for expectancy theory. Little support was found for the multiplicative combination of ability, role perception, and expectancy beliefs as the best predictor, although some combinations of these variables can significantly predict performance. The combination that proved to be the best predictor of performance was Effort leading to Performance multiplied by the summation of Performance leading to Outcomes, $[(\text{Effort} \rightarrow \text{Performance})(\Sigma \text{Performance} \rightarrow \text{Outcomes})]$. Expectancy was shown to be a good predictor, while valence was not. As a possible explanation of this phenomenon, Lawler and Suttle suggested that the theory is so complex, that it has exceeded the measures used for testing, and therefore the results may not be valid. Schmidt (1973) generated two sets of artificial data to run similar tests.

He tested fourteen different relationships between valence (V) and expectancy (E), of which ten were additive and four were multiplicative. He found that currently used measures and research processes can not show whether the multiplicative model holds, but he did get some positive results for the additive approach.

Heneman and Schwab (1972) reviewed nine published field studies on predictions of employee performance. They are: Georgopolous, Mahoney, and Jones (1957), Lawler (1966), Galbraith and Cummings (1967), Lawler and Porter (1967), Hackman and Porter (1968), Porter and Lawler (1968), Gavin (1970), Lawler (1968), and Goodman, Rose, and Furcon (1970). Gavin (1970) is the only paper not previously discussed. His was a study of candidates for management positions to find the relationships between the valences of job outcomes and the first and second level expectancies of getting these outcomes. Heneman and Schwab cited Vroom (1964) and Porter and Lawler (1968) for expectancy theory. The final tabulations of the findings of the nine studies showed valence, instrumentality, and role perceptions to be significantly related to performance, while ability was not significant in the nine cases. The outcome showed support for expectancy theory.

Wahba and House (1974) also reviewed the theory, but not with the test cases. They were concerned with the concepts of work and motivation, with respect to work done by today's industrial and organizational psychologists. Their

conclusions revealed that intrinsic and extrinsic valences should be included in the calculation for a value of motivation. The same authors did another review of the literature that was even more extensive. House, Shapiro, and Wahba (1974) saw the theory predicting the following variables: job effort and job performance, job satisfaction, managerial motivation, the importance of pay and pay effectiveness, coalition formation in organization, and occupational choice. The review covered thirty-one studies of recent vintage and is useful in learning what is new among developments in expectancy theory. The first four variables have been discussed in this section. The others will follow, with those more highly related to the college-choice decision covered last.

House (1971) wrote on leader effectiveness, taking a path-goal approach. Interest lay in the effects of a leader's behavior on subordinate satisfaction, motivation, and performance. He ran three studies and found strong support for the model in all three cases. The leader's own motivation was given a value calculated from a formulation using intrinsic valences associated with both goal-directed behavior and work-goal accomplishments, the extrinsic valence associated with work-goal accomplishment, the path for attaining the goal, and for the path of the work-goal for extrinsic valence.

Wahba (1972) has applied expectancy theory to coalition formations. He first distinguishes coalitions formed under conditions of certainty and uncertainty of success. When con-

ditions of certainty or of uncertainty are recognized, the coalition expected utility model can be employed to predict the coalitions that are more likely to be formed. Predictions were made using a triad, such as within A, B, C. Wahba ran tests on subjects playing card games and found results supporting his model.

Mitchell and Biglan (1971) reviewed the literature on what they called instrumentality theory in psychology. They found from their readings that the models have been successful in predicting behavior in three areas of their discipline: verbal conditioning, attitudes, and industrial psychology.

Mitchell and Nebeker (1973) used expectancy theory to explore the relationship between academic effort and performance. They followed a lead from Arvey and Dunnette (1970) that suggested using an additive approach, but they also tried the multiplicative. The subjects were sixty male undergraduates at the University of Washington. They were questioned on the valence of academic outcomes, the instrumentality of good grades leading to each outcome, and the expectancy that performance leads to grades. Actual performance data was available from each subject's academic records so that comparisons could be made. No significant difference was found between the two functions, addition and multiplication, in predicting job performance. The data from the investigation provided some foundation for expectancy theory and predictions of effort and performance.

Mitchell joined Albright (1972) in using the theory to predict satisfaction, effort, performance, and retention of naval aviation officers. They studied fifty-one pilots and flight officers from two squadrons. They were questioned on the perceived attractiveness of some role outcome i and then on the perceived instrumentality of the work role for the attainment of that outcome i . The products of these two values were summed over the number of job outcomes under consideration to get a value that the writers called job satisfaction. The data from the questionnaires supported this relationship. There was only moderate support for the job effort model which is the product of the expectancy of effort leading to successful performance and the summed products of the perceived attractiveness of the i^{th} outcome from successful performance and the perceived instrumentality of successful performance for attainment of the i^{th} outcome. They still claimed to expect the concepts to be useful in predicting work behavior.

The following three studies, by Holstrom and Beach, Vroom, and Mitchell and Knudsen, are organizational choice studies and are directly of interest in the study of the college-choice decision. Holstrom and Beach (1973) made a study that is of interest because of the similarity of the organizational-choice decisions examined and of the approach taken. They studied career preferences and attempted to demonstrate how the individuals' alternatives correspond to associated

subjective expected utilities (SEUs). The subjects were senior psychology majors who were asked to rate both the preferability of eight occupations and the eighteen kinds of payoffs in terms of the perceived importance (utility) leading to satisfaction with the career. Next they estimated the probability of each occupation yielding each of the payoffs. Using this data in the following equation, SEU's were computed for each of the eight occupations for each subject.

$$SEU = \sum P_i U_i + (1-P_i)(-U_i)$$

where: P = the probability of the occupation leading to the payoff

$1-P$ = the probability of the occupation not leading to the payoff

U = the stated utility of each payoff

$-U$ = the difficulty of each payoff

The results show that relative occupational preferences can be predicted using the relative magnitudes of the associated subjective expected utilities. The authors point out that the decision must be dissembled into its component probabilities and utilities. Vroom (1966) used the model in a study of the occupational choices of thirty-one graduate students. All thirty-one of the students were in a program of training in management and were at the stage of the program where they were choosing organizations in which to begin their careers. Vroom had each student list his three most attractive organi-

zations and then to rate each of fifteen goals according to the extent to which he believed that he would be able to attain the goals within each of the organizations. Next, the subjects listed the three jobs by preference. With this data, Vroom was able to apply his hypothesis that the attractiveness of an organization to a potential member is directly related to the level to which he perceives it will help him to attain his goals. Vroom found that he had predicted correctly in 76% of the cases, plus there was one person who had a tie for first choice, making him an unpredictable case. This is good evidence in favor of a model when over three-fourths of the outcomes can be predicted correctly before the decisions are made.

Another point found by Vroom is of interest in analyzing the results of the Georgia Tech study. His findings showed that the predictions of the decision outcome were good before the decision process was completed, but when the test was readministered after the decision had been made, the results showed even greater support indicating that the subjects were enforcing their own selections. Yet, a further test made after the respondents had started their jobs revealed a drop in the scores for the chosen organization. Vroom is pointing out the importance of the timing of the administration of a test, which is something that must be taken into account in the present study.

Mitchell and Knudsen (1973) made a study of students'

attitudes toward business and their choice of business as an occupation. They developed a formulation to predict the attitudes toward the choice of business as an occupation:

$$Att_{Bus/Occ\ Ch} = \sum [I_i V_i + EX_p MC_p + EX_f MC_f]$$

Where: Att_{Bus} = attitude toward business

$Occ\ Ch$ = attitude toward business as an occupation

IV = instrumentality/valence construct

EX_p = perceived expectations of peers

MC_p = motivation to comply with one's peers

EX_f = perceived expectations of family

MC_f = motivation to comply with one's family

Questionnaires were sent by mail to 141 male psychology students and 141 male business students, all chosen at random. The responses came from 106 students, 53 in each major. There were measurement scales on the questionnaire for each of the following variables: attitude toward business, occupational choice, valences, instrumentalities, expectations of others, and motivation to comply.

In general, there was good support for the instrumentality approach to the evaluation and choice of an organization. The evaluative predictions, however, were more reliable than the choice predictions. It was hard to determine anything based on the values held personally by the students because the psychology and the business students expressed

similar goals and values. The results suggested that students shun business because they perceive a low instrumentality for achieving their goals (and values) through a business career. This is important because the instrumentality value is not improved by weighting it by valence. If instrumentality is the important variable, which it appears to be, then the theory is somewhat supported when the I value correlates highly with the predictions. It seems that even the students choosing business as a career did not perceive it as being highly instrumental in achieving desired values. Thus, overall, this case is supportive of the theory, however, if the researchers' formulation is not correct, the results may not be so supportive. An element that may have been overlooked is social desirability of a business career. Such an oversight may over-ride support of the theory.

Of the twenty-nine studies of expectancy theory reviewed here, twenty-two are laboratory or field studies. These twenty-two studies in general are supportive of the theory with fourteen cases strongly supporting the theory, one not supporting it, and seven showing moderate support. The other seven studies are reviews of the literature and reach similar conclusions to the present test. What has been found yields results that are encouraging for the prospects of success in the present study.

The expectancy model demonstrates that the decision-maker makes choices using a process that can be simulated to

Table 1. Summary of Expectancy Literature

Study	Variables	Approach	Success for Theory
1. Georgopoulos, Mahoney, & Jones (1957)	work performance Instrumentality	path-goal	yes
2. Galbraith & Cummings (1967)	work performance I, E, V	Vroom model	yes
3. Hackman & Porter (1968)	work effectiveness, E, V	Vroom model	somewhat
4. Lawler & Porter (1967)	performance, V, E	Vroom model	yes
5. Lawler (1968)	job performance, E, V	Vroom model	yes
6. Jorgenson, Dunnette, & Pritchard (1973)	performance, E, V	Vroom model	yes
7. Pritchard & Sanders (1973)	V, I, E, performance, effort	(V), (V + I), (V x I)	yes
8. Pritchard & DeLeo (1973)	V, I, performance	Vroom model	no
9. Sheridan, Slocum, & Richards (1974)	performance, V, I, satisfaction	Vroom model	somewhat
10. Goodman, Rose, & Furcon (1970)	performance, incentive (V), I	Vroom model	yes

Table 1. Summary of Expectancy Literature (Continued)

Study	Variables	Approach	Success for Theory
11. Cohen & Turney (1973)	performance, V, E	Vroom model	yes
12. Wofford (1971)	performance, E, V, satisfaction	Vroom model	yes
13. Graen (1969)	motivation, effort, V, I	Vroom model	somewhat
14. Lawler (1966)	ability, performance, V, E	Vroom model	yes
15. Lawler (1967)	performance	literature search	yes
16. Schwab (1973)	V, I, performance	Vroom model	yes
17. Lawler & Suttle (1973)	effort, performance, V, I	seven relationships	somewhat
18. Schmidt (1973)	V, E	14 relationships	somewhat
19. Heneman & Schwab (1972)	V, I, role perceptions, performance	literature review	yes
20. Wahba & House (1974)	motivation, intrinsic & extrinsic V	literature review	somewhat
21. House, Shapiro, & Wahba (1974)	performance, org. choice, leadership, etc.	literature review of 31 cases	somewhat
22. House (1971)	leadership effectiveness, V	path-goal	somewhat

Table 1. Summary of Expectancy Literature (Continued)

Study	Variables	Approach	Success for Theory
23. Wahba (1972)	Coalitions, V, E.	Coalition E V model	yes
24. Mitchell & Biglan (1971)	V, I	literature review	yes
25. Mitchell & Nebeker (1973)	performance, V, I, E	(V x I) (V + I)	somewhat
26. Mitchell & Albright (1972)	satisfaction, performance, effort, V, I, retention	$W = E[\Sigma (A' \times I)]$ $S = \Sigma (A \times I)$	somewhat
27. Holstrom & Beach (1973)	organizational choice	SEU	yes
28. Vroom (1966)	organizational choice, V, I, E	Vroom model	yes
29. Mitchell & Knudsen (1973)	V, I, (-ntrinsic & extrinsic) E	see text	somewhat

explain how the decision was made and to predict what future choices will be upon knowing how the individual feels about certain outcomes and what he thinks that the probability is of him getting that outcome if he makes a particular choice. It is interesting to note the differences in these cases and the studies concerned with the college-going decision which follow in the next section.

College Choice Literature

The decision of a young person to go (or not to go) to college has come under the scrutiny of many researchers. What they have found is of interest in studying the college-choice decision, although it may not be directly related. A search of literature revealed that most work done has been on the college-going decision rather than on the college-choice decision, both of which are important choices for the individuals, institutions, and society. Some studies have been found that investigate the college-choice decision and some have been published that confound the two decisions. The first section will discuss the studies of the college-going decision, followed by those covering both it and the college-choice decision, and finally will come the discussion of studies of the college-choice decision.

The College-Going Decision

Herr and Cramer (1968) suggested simple models to guidance counselors based on background factors that influence the

choice of college. One such model was the traditional trait and factor approach which is based on the rationale that an individual matches his particular set of traits to the requirements of a particular program or institution. Another approach said that the student chooses a school to maximize his gains and to minimize his losses. The next theory is that people make selections within their own social strata. A final model is based on the individual's need reduction activities.

Trent and Medsker (1968) took a different approach to the idea of a student going to college. They studied background variables and did not try to make any predictions as to what the subjects would choose to do. They instead followed what the individuals did do by following the college and non-college careers of ten thousand high school graduates across the United States through patterns of work, college, and marriage over a four year period. Their concern was to find the different impacts of college and employment on values and attitudes. For this, they assessed the students' personality characteristics, values, goals, academic aptitude, and the social, economic, educational, and cultural backgrounds in the senior year of high school and at intervals during the next four years. They used psychometric measures (including ten attitudinal scales from the Omnibus Personality Inventory that measure anxiety and intellectual and social attitudes), a student questionnaire, and interview schedules. Although

their research topic is not of primary interest in the development of the present study, many of their secondary findings are. They found both ability and socioeconomic status to be associated with college attendance, as shown by the distribution of students entering college in 1959 who were studied by Trent and Medsker. Approximately 60% of the graduates in the upper two-fifths of the sample's ability distribution (as measured by the School and College Ability Test scores) started to college that year, while less than 20% in the middle fifth, and less than 10% in the bottom two-fifths. High ability was seen here to be related to college attendance, but some 40% of the brightest students did not enter. Further findings showed that three out of every four students from professional families entered college that year, while only one in four went from homes of semiskilled and unskilled workers. A strong association between college attendance and parent's educational level was stressed. Trent and Medsker found it to be easier to predict whether or not the subject would attend college upon knowing the father's occupation than from knowing the student's ability. Two indices from the cultural background were found to correlate highly. These were the amount of serious reading done by the parents and the frequency with which the subjects discussed serious world affairs with family and friends. Although the researchers do not comment, it appears that these factors are based upon the educational level of the parents.

Douvan and Kaye (1962) made a study through Vassar and had similar findings. They found that many high school students from upper and upper-middle class homes make no conscious decision, which the researchers say is because the young people are taught from their earliest years that after high school comes college. They cited research from Hill's (1954) four-year study which concluded that the most potent determinants of proneness to attend college are in the cultural and educational traditions, ambitions, and hopes of the family. A history of college attendance in the family, friends in college or going, identification of college education as a means of improving one's lot were found to be strong determinants of the child's educational future. Douvan and Kaye found peer force to be important in whether lower-class youths decided to go to college. It was shown that in the lower-middle class, some subtle irritation of the parents or some dissatisfaction with their own lot are critical features that distinguish the family situations of boys who plan to go to college. In these families, parents translated their personal dissatisfactions into a mobility quest communicated to their sons. No consistent findings were made for a comparable group of girls. The same women did find some information on scholarly girls. They found close involvement with parents and early and persistent awkwardness in social relations with peers to be important background features. Furthermore, close and problematic ties to the parents cre-

ated certain strong emotional drives which are channeled into scholarly activities when there is support and encouragement from one or the other of the parents. High academic achievers are characterized by a high activity level, decisiveness, and a willingness to conform to academic requirements, routine, and regulations.

Mulligan (1951) translated all of the motives for college attendance into factors that are based on socioeconomic background. For this study, he used 1,444 cases, which was a 20% sample of all of the male students attending Indiana University during the second semester of the 1946-1947 academic year. He found that the white-collar group sent 54.7% of the students to the university, while making up only 24.4% of the state's population, the blue-collar group contributed 30.5% of the students from a state population base of 60.1%, and farmers sent 9.4% of the students from 14.0% of the state population. Actually, attendance was even more class-biased than these numbers indicated because the white-collar families tended to be smaller than those of the other two groups. Mulligan found which students were getting financial aid under the G I Bill of Rights and determined which had been to college before military duty. For those who had been out of high school and not in college for a period of time before entering the military, he assumed that they were financially unable to attend college. He analyzed this on the basis of father's occupational level and found that the sons of white-

collar and skilled groups were not in college, on the whole, due to economic rather than cultural factors, but in general, the absence of talented students from farming, semiskilled, and unskilled groups in institutions of higher learning was due to cultural rather than to purely economic factors. This tended to support Mulligan's theory that the culture of the lower classes tends to obstruct the educational development of their children by emphasizing the importance of going to work and contributing to the family income at an early age. Immediate financial returns are given priority over present sacrifices for future advancement. So even when students from the lower class graduate high in their high school classes, many do not continue with their education. The question of motivation is real, and as McClelland (1958) said in his discussion of Mulligan's study, there is the possibility that these students do not want to pursue high level careers.

Strodtbeck (1958) followed the idea that family interaction and values are prime determinants of achievement. He found that high achieving behavior relates to behavior that makes the child more independent of the family. Striving for achievement is more noticeable according to Strodtbeck in boys who perceive their parents as reserved and their relationship with their parents as unsatisfying. He showed that the value system of the family members is apparent in the choice of the son's occupation. The same rationale follows for the college decision. The values of the family are translated into the

value of education. The high achievers see college as a means to mobilize their position. In essence, Strodbeck concluded that when the family is a small and relatively independent subsystem, the roles of its members have implications on the attitudes toward the system outside of the family group.

Dole (1967) conducted an extensive study of reasons for college attendance. The subjects were 214 males and 306 females who were students at the University of Hawaii. He had developed through pilot studies an inventory of reasons for going to college which he presented to the students as freshmen and again to the same group as seniors. The first run was in the fall of 1960 during registration and the repeated administration was in the fall of 1963. The freshmen were asked to rate the factors according to importance to them. The seniors were asked to do the same, but with the addition of the phrase "So far as you can remember now" to the list of factors that were this time expressed in past tense. There were sixty-eight items to be rated which broke down into thirteen categories. These are worth mentioning because of their value in helping with the initial preparation for the questionnaire used in the present study. They are social reasons, conformity, curiosity, academic value, material value, altruistic value, previous school influence, experience, avocational influence, science interest, humanistic interest, and verbal interest, plus ability, which Dole added onto the other factors.

Dole was primarily interested in the background influences that acted upon the students as they made their decisions. The outcome may or may not have been a surprise for him because material value and conformity proved to have the highest loading while experience and humanities interest tended to be least. After surveying the group as seniors, Dole reported a discrepancy between the results of the group in the two phases of the experiment. A possible reason for the difference is that the students may have matured over the period of three years, which would be reflected in their motivations. Another possibility is the idea that the students were less willing to disclose reasons which were considered to be socially undesirable by the freshmen that seniors would be more willing to admit.

The College-Going and the College-Choice Decisions Confounded

The next section covers studies that do not distinguish the college-going from the college-choice decision. When information can be separated as being relevant to one decision or the other, it was useful to the present study. Greenshields (1957) did not distinguish the college-going decision from the choice between schools. He covered a broad cross-section of 656 seniors from eight public high schools in the southwestern part of the state of Washington. The survey was made five weeks before spring graduation, so the decision was still fresh in the minds of the respondents, and in some cases may still have been in process. Greenshields asked the stu-

dents what reasons that they had or what influences were on them in their choice(s). They could list as many as they wished, yet no respondent gave more than four of either reasons or influences. In all, a total of 1,038 factors were listed by the group, breaking down into thirty reasons to go to college and twenty-eight influences. The tabulations were made by sex and in percentages. The most common for both sexes as reasons were "Preparation for a good job", "Training for a specified vocation", "Social education", and "Training for an unspecified vocation". These five categories accounted for the reasons for 80% of the boys and 61% of the girls. The influences fell clearly into certain trends, too. Parents, teachers, friends, and no one covered the majority for both sexes.

The 138 boys and the 246 girls who gave reasons for not going to college specified lack of money, conflicting plans, (military service, marriage, a job), and not liking school as their major reasons. Three-fourths of this group said that no one influenced them. Sixty-three boys and forty-eight girls gave factors for being undecided. Uncertainty about money was first, followed by the indecision of whether to go to college or to do something else and having no desire to go to college.

Greenshield's findings indicated that the seniors associated a college education with preparation for a vocation. The careers often listed require a college education, as in

the cases of law, engineering, medicine, and dentistry. There appeared to be a strong economic overtone in the stated motivations for going to college.

Stordahl (1970) administered a brief questionnaire to the 1966 freshman class at Northern Michigan University to obtain their perceptions of influences on their college choice. He measured the effect of four factors, Intellectual Emphasis, Practicality, Advice of Others, and Social Emphasis, and then related the factors through a three-factor factorial analysis of variance to sex, scholastic aptitude, and distance of the home from the university. Only Michigan residents in school full-time for whom the researcher had access to background data were surveyed. As in Dole's study, Stordahl had each respondent identify himself on his paper, so there again was the possibility that a bias might have been less if the individuals could have remained anonymous. The results showed that all student groups gave substantial emphasis to intellectual considerations in choosing a college, and all felt that the advice of other persons had little influence upon their decisions. A study conducted by "College Student Survey" (1969) on groups of freshmen and sophomores reflected different priorities from those found by Stordahl. The subjects were given a list of statements and were told to choose and rank three as their strongest reasons for going to college, and then to select and rank their three weakest. "College as a place to develop personal abilities" is followed

closely by "College as a place to learn a profession" (or white-collar occupation) as the leading factors. Similar findings were revealed by Hartman (1968) in his study to determine motives for college choice. He claimed to be interested in the differences in reasons for students going to state and to private colleges, so he surveyed freshmen at southern Illinois University and at a nearby resident, private college. A list of nineteen statements that are reasons for going to college was given to each student to rank the items in order of importance. The same list was given to both groups. There were no apparent sex differences within each group, but there were a few interesting differences between the two groups, in particular for the factors rated to be weakest. Both groups rated the same four statements within the top five choices. These are "College training is required for the life work I have selected", "I am looking for more information and knowledge", "I wanted to learn how to function better as an individual", and "I am interested in a specific subject". The outcome showed that the reasons are quite often short-term goal-oriented, although the statement about college training for the life work showed some long-term thinking. This may fit into a theory by Ginzberg, Ginsberg, Alexrad, and Herma (1951) that the career choice operates during three distinct stages in a young person's life. Deciding upon a college to attend may be construed to be the second period, in which the student makes tentative choices

approaching reality situations, although he still makes no certain commitment.

The College-Choice Decision

The studies in the following section discuss research done on the college-choice decision. Douvan and Kaye (1962) postulated that the actual choice among colleges is made in most middle-class homes with parents playing a major role. They may enter into the decision either explicitly, or more subtly through the values and attitudes of the home or by setting certain limits (cost, distance from home, etc.). To enter directly into the process, the parents must have knowledge about various alternatives, so often they are unable to be direct because of lack of information.

Holland (1958) conducted a study of the college selection process among high aptitude high school seniors. He obtained the sample through the National Merit Scholarship Program from the group of 7,500 finalists in the 1957 testing in which some 162,000 high school seniors participated. An 11% random sample, 814 students, were involved. Those surveyed scored in the stratum composed of the top 5% of the nation's seniors. They were asked the question, "Why have you selected _____ College?", and the results are the data Holland used. The students generally make two to three responses so he had a large quantity of information to work with. Typically, the statements appeared to be opinions based upon institutional evaluations acquired from other stu-

dents and adults. The schools chosen were usually not defended by citing how the institution satisfies criteria of eminence, economics, etc., but rather the institution was cited as meeting special personal needs and situational problems.

Holland's findings were separated by sex and tabulated by percentages. Both sexes seemed to be highly impressed with the reputation of the college, as over a half of the sample listed "Good College" as the reason for their choice, and to a lesser degree, they marked "Academic Standing". These findings are of interest and were used as suggestion in developing the present study, but there is a question as to the generalizability of Holland's data given the sample restrictions. The students surveyed were not representative of high school seniors nation-wide because they were a cross-section on the top 5% only. It is very likely that students from certain categories of schools (rural areas, underprivileged neighborhoods, etc.) were totally excluded. Even though the students were not a universal sample, they are more like the students who do attend Georgia Tech than would be a sample of the universal population. Also making this information valuable is the fact that the decision was solely between (or among) colleges and not on whether to go to college.

Two recent studies are available on the freshmen at the Georgia Institute of Technology. Both fit into the cate-

gory of those studies that confound the college-going and the college-choice decisions, but the data are useful because of pertaining to the institution that is used in the present study. The study conducted from the Berkeley Center for Research and Development in Higher Education, (from which Trent and Medsker worked) by the American Council on Education surveyed entering freshmen in colleges, junior colleges, and universities across the United States to get a profile of background information, expectations of college life and performance, personal opinions, and objectives. A total of 579 institutions participated in the survey in the fall of 1973, so the 1973 freshman class at Georgia Tech can be compared to the national averages in the categories mentioned above. The results showed Georgia Tech students to be younger than the national average and to have better credentials academically. Having a good academic reputation was said to be an important factor in college choice by 87% of the Georgia Tech freshmen as compared to the national response of 57%. Educational and career aspirations were both significantly higher than the national average. The information from this study and from one conducted during the same time frame by Georgia Tech Director of Admissions Jerry Hitt support each other. Hitt (1974) surveyed all students accepted into the 1973 freshman class at the Georgia Institute of Technology both to determine the effects of the procedures used by the Admissions Office and to find what does influence the student's decision

as to which college to attend. He found that 98% of the students who decided against Georgia Tech were still planning to attend college in the fall of 1973, so essentially their decision not to attend was not a decision as to whether or not to go to college. Background data showed that these students are from the socioeconomic classes that Douvan and Kaye said that traditionally send the youth to college, but this is not a critical point here because the decision that this influences, that is whether or not to go to college, appears to already have been made. The students overwhelmingly marked academic reputation as the primary reason for choosing the school, and they went on to say that they themselves were the influencing person. This was similar to the findings of some of the studies previously mentioned (Stordahl, Holland).

The findings reviewed above provide a good start on the research for this thesis. The data found from previous studies are a foundation for the study of how a student makes a choice.

The Research Question

The intent of the review thus far has been twofold: to examine the alternative expectancy-type formulations which have been investigated in the literature on behavioral decision theory, and to assemble the variables which have been found relevant to the college-choice decision specifically. In light of this review, the following research question is proposed for the research reported in the remainder of this

paper:

Research Question: What is the predictive efficiency of simple expectancy-type models in the college-choice decision environment?

Definitions: "Predictive efficiency": the extent to which a specified model correctly predicts the college choices actually made. Operationally, measure of predictive efficiency to be examined is the percentage of correct predictions.

"Simple expectancy-type models": models in which an individual's choice is predicted on the basis of some simple functional combination of his valences for specified outcome states, and his beliefs as to the probable relationships between available actions and each outcome state. Specifically, two basic models will be considered: multiplicative functions of attainment expectancies, unweighted and weighted by outcome valences. The models to be tested are discussed in more detail in the following chapters.

"College-Choice decision environment": a decision environment in which individuals who have decided to attend college select the specific college they will attend.

Models to be Tested

Consider a decision environment in which an individual chooses an action A_a from the set $A_1, A_2, \dots, A_i, \dots, A_n$ ($n \geq 2$), on the basis of his beliefs I_{ij} that the selection of action i will lead to the attainment of goal j in a decision-relevant goal set $G_1, G_2, \dots, G_j, \dots, G_k$. Assume further that his desire for the attainment of the j th goal is measured by V_j , his valence for the j th goal. Then the general prediction of expectancy theory is that the action chosen will be that having the highest value to him, where

the value of the i th action is some function of I_{ij} and V_j , over all k goals. That is,

$$Val_i = f(I_{ij}, V_j), \quad \text{where } j = 1, 2, \dots, k \quad \text{Eq. 1}$$

and A_a is the action having the highest value.

Assuming that adequate levels of measurement have been attained for the several variables involved, the specification of testable models requires that both the functional form of Equation 1 and the range of goals to be included be specified.

The most obvious functional form is simple additive, $Val_i = \sum_{j=1}^k I_{ij} V_j$ which has the property of allowing a linear tradeoff between one goal state and another. In addition, given the continuing debate as to the value of including "importance" terms as weighting variables in such formulations, it is of interest to test a model in which no weighting is used:

$Val_i = \sum_{j=1}^k I_{ij}$. The two basic models to be investigated are thus:

$$\text{Model 1: } Val_i = \sum_{j=1}^k I_{ij} V_j \quad \text{Eq. 2}$$

$$\text{Model 2: } Val_i = \sum_{j=1}^k I_{ij} \quad \text{Eq. 3}$$

The identification and selection of goal states to be included in any given model is, clearly, critical to the predictive success of the model. In the present study, an attempt was made to first generate a comprehensive list of pos-

sible relevant goal states, and to construct a base-line model for each of the two functions listed above. A "reduced" model was then tested, using a smaller set of goal states selected on a number of different bases. The rationale for the "reduced" models is reported, along with the measure of predictive efficiency, in the "Results" section of this paper. The development of the data-gathering instrument, and the design of the empirical portion of the study, is reported in the following chapter.

CHAPTER III

STUDY DESIGN

It is the purpose of this chapter to discuss how the study was designed and implemented. The first section identifies the decision-relevant goals. A questionnaire was used as the medium to gather the data on the decision, so its design is described from the origination, through the pilot tests, to its final stage, in the second section. The sample design and composition are discussed in the third section. The details of the administration and processing are covered in the fourth part.

Goal Identification

An identification of the decision-relevant goals is necessary for all subsequent discussion of this study. The questionnaire in its final state lists twenty-three factors that possibly may be attained by the subject through the selection of a particular school for attendance. The twenty-three individual items are of three general categories: social, academic, and practical. The goals are examined in the questionnaire to find their desirability to the subject and the subjective probability of attaining each at Georgia Tech and at his next best option (the school that he has chosen to attend over Georgia Tech or the school that he would

have attended had he not selected Georgia Tech).

Questionnaire Development

A questionnaire was deemed to be the most effective medium to gather the data on the college-choice decision. Two types of questions needed answering, those asking for background information and those rating the goals referred to above. The list of goals was originally compiled from the factors used by other researchers, notably Dole, Holland, Greenshields, and Hartman. The design called for the student to rate all items on three different Likert-type scales. The first scale measured the importance of the factor to the individual, the second measured to what extent each thought that he would attain each item by attending Georgia Tech, and the third reflected each one's subjective probability of attaining the items by attending the next best option. Likert-type scales allow the subject to mark a value for each item for which he has feelings. This kind of scale was chosen because it allows all of the subjects to discriminate upon the same standard set of values which can subsequently be fitted into the models.

The pilot test was not a formal run, primarily because of the lack of time and resources and because of the use made of information from the studies cited previously. The questionnaire was presented to approximately one hundred people, who are students, faculty members, and administrators at Georgia Tech. Over a half of this group were freshmen who

should remember what the influences and reasons were in making the selection of a college to attend. The students approached with the document were freshmen majoring in Undecided Engineering who came into the Dean of Engineering's Office for academic advisement, freshmen and sophomores who work at the Georgia Tech student radio station, and individuals in all classes encountered on campus. The professors and administrators were selected because of their experience with either students making the college-choice decision or with the administration of questionnaires. Comments and responses from the test subjects caused minor changes to be made that led to the development of the final form.

The questionnaire in its final stage was a two-page document, with the first page covering the background information and the second asking for the ratings on the list of goals. The background data asked for was age, sex, hometown and state, and high school graduation date. To ascertain the decision as a college-choice rather than college-going, a question asked if the subject has decided to start to college, and if so, when. The next item asked for a list of schools applied to in order of preference, and an indication should be given for each college as to whether or not he was accepted. The next question asked whether a school had been definitely selected, and if so, which college. The addition of the inquiry of whether a major has been definitely selected was made based upon suggestions from the test subjects.

The second page was the roster of twenty-three items to be rated by each subject.

The rating scales were given values with ranges that allowed the respondents to make distinctions on each item. The desirability scale ranged from "-3", Very Undesirable, through "0", Neutral, to "+3", Very Desirable. Negative values were included to reflect negative feelings toward any of the factors. The scales showing the subjective probabilities of getting the factors at Georgia Tech and at the other college were a "0, 2, 4, 6, 8, 10" scale, where "0" is low and "10" is high. A zero-point allows the subject to express his perception of attaining each of the factors from absolutely no chance of getting the item to a certainty of getting it.

The Sample Group

The following section discusses the sample group. The population used for this study was the group of 3,654 individuals whose applications had been processed for admission into the 1974 fall quarter freshman class at the Georgia Institute of Technology as of June 1, 1974. Therefore, all of the subjects had been notified by the institution prior to the administration of the questionnaire as to whether or not they had been accepted for admission. The group of 3,654 breaks down into two categories: the 1,473 students expected to matriculate and the 2,181 who were either not admitted or had decided not to enroll at Georgia Tech. The students expected

to attend are those who paid a deposit to substantiate their intentions of attending. The 3,654 questionnaires were mailed in mid-June, at a time when most of the subjects would have made the decision as to which college to attend.

Administration and Processing of the Questionnaire

The administration and processing of the questionnaire will be discussed in this section. There were two enclosures sent with the questionnaires: a cover letter and a postage-paid return envelope. The letter congratulated the student on being in an exciting position, that of deciding whether to begin a career or to attend college (and thus, which particular school). It also gave a brief explanation of the study, why the subjects were selected to participate, and what the purpose is. To add credibility, the names and a method for contacting people to whom they can ask questions about the study were included. The return envelope was sent in hopes of a high return rate.

The rate of return was good, 49%. Of the returned forms, 3% were not usable because of missing data, and another 4.7% arrived after the cut-off date (July 26). The analyses cover 1606 respondents, which accounts for 44% of the individuals whose applications were processed for the freshman class of the fall of 1974.

As each response arrived, it was coded for keypunching. The background data were coded into alphanumeric and numeric

symbols. The two punched cards contained all of the data for each subject used in the analyses component of this study.

This chapter was intended to discuss the acquisition and processing of the data used in the analysis of the college-choice decision and in testing the decision models. Questionnaires mailed to students applying for admission into the 1974 fall quarter freshman class at the Georgia Institute of Technology were the medium for gathering the information. The data from 1606 respondents were coded and keypunched onto cards for computer-run analyses which will be discussed in the next chapter.

CHAPTER IV

RESULTS

This chapter describes the data analyses and attempts to interpret what the results mean. The first section of this chapter discusses the analyses of the data, the second section covers the tests on the models used, and the third, and final, section discusses the results of each analysis and what they mean.

Analyses of the Data

The questionnaire responses were coded and key-punched for data analysis, which was performed using the Statistical Package for the Social Sciences (SPSS) programs (factor means, correlations, frequency distributions, and computations). A maximum of 1606 responses were available for the analyses, with smaller numbers of cases in several analyses as a result of incomplete data. Specifically, the decision models were tested only for those cases in which the respondent indicated that he had applied to Georgia Tech and at least one other school; that he had made a final choice between these schools; and his data was complete on the valence and expectancy measures. The sample size on which the analysis is based is noted for each analysis.

Background Survey of Applicants

To satisfy the purpose of finding out the profile of the group of applicants, a summary of the answers given by all 1606 respondents was compiled. It gave an interesting insight into the group. The results can be seen in Appendix IV. The results show that most of the students have been accepted at Georgia Tech (1466) and most are men (84.2%). The average age is 17.3 years, 96.4% graduated from high school in either May or June of 1974, and 93.4% planned to enter college in August or September of 1974. The majority (55.6%) are from rural areas or smaller cities (those with populations under 100,000). The group is split by geographical origin, where the plurality (43.5%) is from outside of the Southeast. The mean number of colleges applied to (2.93) is slightly higher than the average number of acceptances (2.29). The group mean rank of Georgia Tech among colleges applied to is 1.8. Included in this group is the subgroup of students choosing to attend Georgia Tech. This group comprises 32.4% of the total population (520 respondents). Again the group is predominately male (83.5%). Most who have definitely chosen a major (54.9%) have selected some field of engineering.

Preliminary Analyses

It is of interest to investigate the possibility of the occurrence of two types of correlations among the data. The first area of investigation is to find to what extent the Valence (V) and the Instrumentality (I) factors may be meas-

uring the same perceptions of a college. Second, there is the possibility that the 23 goal states used may be partially redundant--that is, they may reflect perceptions of some smaller set of underlying dimensions. This suggests that reduction of the goal state list, either by elimination or combination, would yield predictive accuracies as great as would the entire list.

The first type of correlation investigated is that between the values of Valence (V), Tech Instrumentality (I_T), and the Instrumentality of the other college (I_O) for the twenty-three states. Appendix V shows the results for the total sample of 1606 respondents and of the subgroup of 714 used to test the models. It is worth mentioning that for all outcomes, V is positively correlated ($p < .01$) with both I_T and I_O , and those correlations are stronger for the college actually chosen. For the group choosing to attend Georgia Tech, $\bar{r}_{VI_T} = .49$ and $\bar{r}_{VI_O} = .33$, and for those choosing to attend the other alternative, $\bar{r}_{VI_T} = .26$ and $\bar{r}_{VI_O} = .45$. This indicates a positive association between the desirability of an outcome (which V is designed to measure) and the expected probability of attaining that outcome (which I measures).

The exploration of the second conjecture, of a set of dimensions smaller than twenty-three is strictly a problem for factor analysis, but this procedure was felt to be outside of the scope of the present research. A preliminary step in this direction was made by examining the intercorrela-

tions between the twenty-three measures, and attempting to group items together on the basis of their intercorrelations, and a face judgment of their similarity. This procedure yielded eight clusters of items (see Appendix III) which each appear to tap somewhat distinct dimensions of the goal space. Simple indices were computed for each of these clusters (by summing the raw scores on V , I_T , and I_O , and dividing by the number of items included), and these index scores were used in predictive models.

Tests of the Models

The following section discusses the tests of the two expectancy-type models that were presented in Chapter II. The responses of the 714 cases are used for the twenty-three items and from the reduced factor sets that were described in the previous section. As stated before, the measure of success for a model is a binary one, based upon whether or not the model correctly predicts the chosen college.

To determine whether a model is a good predictor, there needs to be an alternative method of predicting outcomes so that a comparison can be made to establish the effectiveness of the model under scrutiny. This alternative method could be said to be a "good" predictor based upon chance, so a performance by the expectancy models that is better than this chance predictor would be better than "good", while a lesser performance would not be "good". The baseline model used is

composed using the value p , which is the percentage of individuals actually choosing one alternative, and the value q , which is the percentage assigned to that alternative by the model. A probability of $[pq + (1-p)(1-q)]$ of correct assignments is the random process chance predictor. The difference between its prediction and that of the tested model is evaluated by comparing the normal approximation to the binomial distribution of the chance model with the outcome of the model in question. The results can be seen in Table II.

Model 1. The model proposed by Vroom (1964) is the summation of the products of the Valence and the Instrumentality values for all factors, in this first case, twenty-three. The Valence weighted the Instrumentality values for both Georgia Tech and for the other college, so the two values can be compared for every factor. The sum of these products yielded two values which are expected to indicate the subject's interest in the schools. Equation 2 is the basic formulation followed in this model.

$$Val_i = \sum I_{ij} V_j \quad (i=1,2; j=1,2,\dots,23) \quad Eq. 2$$

where V_j = the valence of goal j

I_{ij} = the instrumentality of college j
for goal i

The same model is tested for the eight composite indices.

Model 2. The unweighted summation for each school's Instrumentality values for each goal is found here. Equation

3 shows this formulation. The test was run for the twenty-three items

$$\text{Val}_i = \sum I_{ij} \quad (i=1,2; \quad j=1,2,\dots,23) \quad \text{Eq. 3}$$

where V_j = the valence of goal j

I_{ij} = the instrumentality of college j for goal i

and for the eight index scores.

Force. The two models generate values that are used to find the value of the Force, F , on the individual to make a particular selection. The net Force to choose Georgia Tech over the other college is F_{T-O} . If the F value is positive for choosing one school over another, and if that school is the one actually chosen for matriculation, then the outcome is called a success. It is this percentage of successes that is compared with the successes of the chance model. If the percentage of the correct predictions made by a model is 4.8% (or more) better than the correct predictions of the chance model, then the tested decision model is significantly better than chance. This 4.8% significance value is based upon the sample size of 714 for the $p < .01$ level, two-tailed.

Results of the Models

This section discusses the results of the two expectancy-type models for both the twenty-three raw-data factors and for the eight indices. The predictive efficiency of the

Table 2. Results of the Model Tests

Model	A: % Correct	B: Chance Level	A (A-B)	N
1.) $F_{T-O} = \sum_{i=1}^{23} V_i (I_T - I_O)_i$	68.0%	50.7%	17.3%	714
2.) $F_{T-O} = \sum_{i=1}^{23} (I_T - I_O)_i$	59.6%	49.8%	9.8%	714
3.) $F_{T-O} = \sum_{i=1}^8 V_i (I'_T - I'_O)_i$	64.0%	50.3%	13.7%	714
4.) $F_{T-O} = \sum_{i=1}^8 (I'_T - I'_O)_i$	59.3%	50.4%	8.9%	714

Note: V_i, I_T, I_O are raw-score measures

V'_i, I'_T, I'_O are composite factor indices

models is compared with the efficiency of the chance assignments. The subgroup of 714 cases was used for all tests.

The model showing the highest predictive ability was the weighted summation (Model 1) using all twenty-three item-scores, which yielded 68.0% correct predictions. The same model using the eight index scores is next with 64.0% correct. Model 2 (the unweighted summation) showed a performance of 59.6% correct using the twenty-three item-scores, and of 59.3% for the eight index scores. In all four cases, the correct predictions were over 4.8% higher than the assignments made by the chance model. Therefore, all four instances are significantly better than the baseline designated for "good". It is interesting to note that for both sets of measures (eight and twenty-three), the weighted approach is the better predictor.

In summary, the two expectancy-type models are good predictors of the college-choice decision outcome. When compared to a random assigner of outcomes, the models proved to be significantly better than "good".

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

It is the purpose of this chapter to discuss the results of the study that were covered in the previous chapter and to make recommendations for further work with this particular study and other segments of the college-choice decision. The first section of the chapter discusses the study and its results and the second covers the recommendations.

Discussion and Conclusions

The research reported has addressed the research question: "What is the predictive efficiency of simple expectancy-type models in the college-choice decision environment?" The two simple models employed correctly predict the decision outcomes significantly more frequently than do chance models so that they can be considered to be valid methods of predicting the outcomes in the college selection process. The models which are supported are:

$$\text{Model 1: } Val_i = \sum I_{ij} V_j \quad \text{Eq. 2}$$

$$\text{Model 2: } Val_i = \sum I_{ij} \quad \text{Eq. 3}$$

The weighted summation shows the better performance with both factor sets. However, both the weighted and the unweighted

models proved to be better than chance predictors.

The study was intended to explore two areas. The first is that brought under scrutiny by the research question, that is to find if the predictive efficiency of simple expectancy-type models for the college-choice decision is such that support is found for expectancy theory. The performance of the models was found to be good enough to be supportive of the theory. The second area to be explored is to find what students take into consideration when selecting a college and to what extent they perceive the schools under consideration will get them the outcomes that are considered. The twenty-three factors were evaluated by the respondents according to how they felt about each of the items according to unimportance or importance. Of interest to Georgia Tech administrators are the values each of the respondents gave for the probability of finding each of the factors by attending Georgia Tech. The school officials can select those items that are important to the group and emphasize how Georgia Tech is strong in these areas. The study yielded positive results for both areas of exploration, expectancy theory was supported and some information of potential value to college administrators was found.

Recommendations

The results of the study are usable. First of all, the Georgia Tech recruiting officials can use the outcome to

evaluate the recruiting policy now being used. They may choose to concentrate on the factors that are important to the respondents. The second use is to further explore the college-choice decision using expectancy theory.

It should again be noted that the questionnaire was administered after the majority of the students had selected a college, but before they had actually attended the school. Vroom (1966) found that the subjects in a post-decision, pre-experience state enhance the chosen alternative. Such a mechanism would, of course, tend to inflate the predictive accuracy of models such as those tested here. Further research collecting data similar to that used here at several points in the decision process, from initial consideration of alternative colleges, through application, acceptance, and actual experience of the college chosen, would cast additional light on these dynamics of the decision process.

The reduced factor approach is also an option worth pursuing. The eight composite factors give valid data that can be plugged into the models. It is impossible to say here how effective the reduced set would be if this were to be the complete list. It is possible that the smaller number of items would be a better data-gathering medium because of not confusing the respondent with the volume of questions.

It is recommended that a more concise list of factors be generated and sent to the sample group at an earlier stage of the college-decision process. Because the support is

found for the simple expectancy-type models, it appears that the models can be further used for predicting the outcomes of decisions such as in the college-choice.

APPENDIX I

THE DATA-GATHERING MEDIUM

GEORGIA INSTITUTE OF TECHNOLOGY

ATLANTA, GEORGIA 30332

ENGINEERING COLLEGE
OFFICE OF THE DEAN

(404) 894-3355

June 19, 1974

Congratulations!

You are now going through one of the most exciting transitions in your life, from high school into either college or a job. You have made a big decision in deciding whether or not to continue your education, and if so, at which school.

We are interested in how people like yourself make such important decisions, both from a research point of view, and because we hope to make Georgia Tech more of the kind of school its students desire. You have been selected from all the students who applied to Georgia Tech this year to participate in this research study. The information YOU give us is important to the study. Please take ten or fifteen minutes to complete the enclosed questionnaire, and return it to us in the reply-paid envelope enclosed.

All the information you provide will be treated in strict confidence, and will not be traceable to you in any way, so PLEASE DO NOT WRITE YOUR NAME ANYWHERE ON THE QUESTIONNAIRE. There are no 'trick' questions, and the only right answers are your honest feelings. Please answer each question as carefully and candidly as you can.

If you would like to talk to either of us about this questionnaire, about the study as a whole, or just about what it is like to be a student at Georgia Tech, please feel free to call us or drop us a letter. We will be happy to help in any way we can.

This study is important to us and, we hope, to you. With your help, we can come up with some interesting and useful results. Thanks very much for your help in our work. Have a good summer, and congratulations on your decision---whatever you have decided!

Sincerely,

Prof. Terry Connolly
School of Industrial &
Systems Engineering.
(404) 894-2330

Ms. Carol V. Vines
Office of Dean of Engineering
(404) 894-3355

Background Information

To help us in analyzing the data from this study, we need to get the following background information from you.

1. Present age: _____ years.
2. Sex: () Male () Female.
3. What state do you presently live in? _____
4. What town or city? _____
5. When did you (or will you) graduate from high school? ____ (month) ____ year.
6. Have you decided whether or not you will go to college?
 - () Yes, I am definitely going to college, starting in ____ (month) ____ year,
 - () I will probably go to college, but have no definite plans yet.
 - () I will probably not go to college.
 - () I have definitely decided not to go to college.
7. Please list below any colleges you have applied to, in order of preference, with the college you would most like to attend listed first. For each, please circle "Yes" if you were accepted by that college, or "No" if you were not accepted.

<u>Applied to:</u>	<u>Were you accepted?</u>	
(1st choice) _____	Yes	No
(2nd choice) _____	Yes	No
(3rd choice) _____	Yes	No
(4th choice) _____	Yes	No
(5th choice) _____	Yes	No

8. Have you definitely decided which college you will attend?
 - () Yes, I have definitely decided to go to _____
 - () No, I have not yet definitely decided.
9. If you have decided to go to college, have you decided what subject you will take as a major?
 - () I will definitely major in _____
 - () I will probably major in _____
 - () I have not yet chosen a major.

REASONS FOR CHOOSING A COLLEGE

We are interested in the factors that you considered in making your college choice. Listed below are a number of factors that people often consider in choosing a college. For each, we would like you to respond according to the scales in the three columns.

We would like to know how Georgia Tech compares with other colleges which accepted you. Not counting Georgia Tech, which of the colleges that accepted you would you most like to attend? Please write the name of this college at the top of Column 3. (If Georgia Tech was your only acceptance, please complete only the first two columns.)

TO WHAT EXTENT WILL YOU GET THIS IF YOU GO TO:

	HOW DESIRABLE (or undesirable) is this college characteristic to YOU?							GEORGIA TECH					(Your best, or next best, option) college						
	(Very Undesirable)		(Neutral)		(Very Desirable)			(Not at all)	(A great deal)				(Not at all)	(A great deal)					
1. Attend a college where I can earn a degree with high academic prestige.	-3	-2	-1	0	+1	+2	+3	0	2	4	6	8	10	0	2	4	6	8	10
2. Attend a college where I can earn a degree which will be of high value to my later career.	-3	-2	-1	0	+1	+2	+3	0	2	4	6	8	10	0	2	4	6	8	10
3. Attend a college where I have a high probability of graduating.	-3	-2	-1	0	+1	+2	+3	0	2	4	6	8	10	0	2	4	6	8	10
4. Attend a college with a strong intellectual atmosphere.	-3	-2	-1	0	+1	+2	+3	0	2	4	6	8	10	0	2	4	6	8	10
5. Attend a college with a strong Cooperative Program, where I can work a quarter and attend classes a quarter.	-3	-2	-1	0	+1	+2	+3	0	2	4	6	8	10	0	2	4	6	8	10
6. Attend a college which will help me grow personally into a mature adult.	-3	-2	-1	0	+1	+2	+3	0	2	4	6	8	10	0	2	4	6	8	10
7. Attend a college where I can contribute to the local community while in school.	-3	-2	-1	0	+1	+2	+3	0	2	4	6	8	10	0	2	4	6	8	10
8. Attend a college where I can make close personal friends.	-3	-2	-1	0	+1	+2	+3	0	2	4	6	8	10	0	2	4	6	8	10
9. Attend a college where I can make friends of the opposite sex.	-3	-2	-1	0	+1	+2	+3	0	2	4	6	8	10	0	2	4	6	8	10
10. Attend a college where I can make friends who will later be helpful professional contacts.	-3	-2	-1	0	+1	+2	+3	0	2	4	6	8	10	0	2	4	6	8	10
11. Attend a college that my friends think highly of.	-3	-2	-1	0	+1	+2	+3	0	2	4	6	8	10	0	2	4	6	8	10
12. Attend a college that my parents think highly of.	-3	-2	-1	0	+1	+2	+3	0	2	4	6	8	10	0	2	4	6	8	10
13. Attend a college that my teachers think highly of.	-3	-2	-1	0	+1	+2	+3	0	2	4	6	8	10	0	2	4	6	8	10
14. Attend a college where I can learn about cultural matters, the arts, etc.	-3	-2	-1	0	+1	+2	+3	0	2	4	6	8	10	0	2	4	6	8	10
15. Attend a college which is famous for its varsity sports teams.	-3	-2	-1	0	+1	+2	+3	0	2	4	6	8	10	0	2	4	6	8	10
16. Attend a college where I will have an opportunity to participate in recreational sports.	-3	-2	-1	0	+1	+2	+3	0	2	4	6	8	10	0	2	4	6	8	10
17. Attend a college where one or more of my friends will be starting at the same time that I do.	-3	-2	-1	0	+1	+2	+3	0	2	4	6	8	10	0	2	4	6	8	10
18. Attend a college where someone I know personally and/or admire attended in the past, or is now attending.	-3	-2	-1	0	+1	+2	+3	0	2	4	6	8	10	0	2	4	6	8	10
19. Attend a college which is in a desirable location.	-3	-2	-1	0	+1	+2	+3	0	2	4	6	8	10	0	2	4	6	8	10
20. Attend a college which is in a convenient location.	-3	-2	-1	0	+1	+2	+3	0	2	4	6	8	10	0	2	4	6	8	10
21. Attend a college which has low tuition and living costs.	-3	-2	-1	0	+1	+2	+3	0	2	4	6	8	10	0	2	4	6	8	10
22. Attend a college where I can get financial aid.	-3	-2	-1	0	+1	+2	+3	0	2	4	6	8	10	0	2	4	6	8	10
23. Attend a college where the academic workload leaves time for on-campus social life and hobbies (dating, parties, campus organizations, etc.)	-3	-2	-1	0	+1	+2	+3	0	2	4	6	8	10	0	2	4	6	8	10

What other factors did you consider in making your college choice?

APPENDIX II

MEAN VALUES FOR VALENCE AND INSTRUMENTALITY

<u>Variable</u>	<u>All Students</u>		<u>Tech Definites</u>		<u>Non-Tech Definites</u>	
	<u>V</u>	<u>I</u>	<u>V</u>	<u>I</u>	<u>V</u>	<u>I</u>
1. Prestige	2.3	8.3	2.3	8.7	2.2	7.7
2. High-valued degree	2.8	8.8	2.8	9.3	2.7	8.2
3. Probability of graduating	1.5	7.5	1.5	7.2	1.5	8.0
4. Intellectual atmosphere	1.6	7.7	1.6	8.0	1.7	7.4
5. Coop program	0.2	6.3	0.4	6.2	0.0	6.5
6. Mature into adult	2.1	7.8	2.0	8.1	2.1	7.5
7. Contribute to community	0.7	5.3	0.6	5.4	0.7	5.1
8. Make personal friends	2.1	7.4	2.0	7.5	2.1	7.3
9. Meet opposite sex	1.8	6.2	1.8	5.8	1.9	6.6
10. Make professional contacts	1.5	7.5	1.6	7.6	1.5	7.3
11. Value of friends' opinion	0.6	7.4	0.7	7.9	0.5	6.9
12. Value of parents' opinion	1.1	8.1	1.2	8.7	1.0	7.4
13. Value of teachers' opinion	0.8	7.7	0.9	8.4	0.7	7.5
14. Grow culturally	0.8	5.4	0.6	5.4	0.9	5.4

APPENDIX II (Continued)

Variable	All Students		Tech Definites		Non-Tech Definites	
	V	I	V	I	V	I
15. Access to sports	0.4	6.6	0.5	6.6	0.2	6.7
16. Recreation	1.5	6.9	1.4	7.1	1.5	6.7
17. Friends start at same time	0.6	3.8	0.7	4.6	0.5	2.9
18. Friends now at school	0.4	3.9	0.4	4.7	0.3	2.9
19. Desirable location	1.8	6.8	1.8	7.8	1.7	5.6
20. Convenient location	1.4	6.0	1.4	6.7	1.3	5.0
21. Low tuition and living costs	1.5	6.0	1.5	6.2	1.9	5.8
22. Financial aid	1.4	4.7	1.3	5.0	1.5	4.3
23. Time for social life	1.8	6.2	1.9	6.0	1.7	6.4
Sample Size	1606		847		699	

Note: The Valences (V) are registered on a scale from -3 to +3, where -3 is Very Unimportant, 0 is Neutral, and +3 is Very Important.

The Instrumentalities (I) are registered on a scale from 0 to +10, where 0 represents a subjective probability of 0 of obtaining the variable and +10 represents a subjective probability of 1 of obtaining the variable.

APPENDIX III

COMPOSITE INDICES

- INDEX 1: Approval of friends, parents, and teachers (items 11, 12, 13).
- INDEX 2: Opportunity for leisure and social activities (items 8, 9, 23).
- INDEX 3: Opportunity for cultural and community involvement (items 7, 14).
- INDEX 4: Career and academic value of the degree (items 1, 2).
- INDEX 5: Location of college (items 19, 20).
- INDEX 6: Financial considerations (items 21, 22).
- INDEX 7: Personal acquaintances (items 17, 18).
- INDEX 8: Sports (items 15, 16).

$$\text{Value of Composite Index} = \sum \frac{\text{Item valences (or Instrumentalities)}}{\text{Number of Items in Index}}$$

APPENDIX IV

SUMMARY OF BACKGROUND INFORMATION

Total Sample = 1606

1.	Tech Acceptances	1466	
2.	Percentage Women	15.8%	
3.	Percentage Men	84.2%	
4.	Average Age	17.3 years	
5.	Geographical Origin:		
	a. Georgia	35.8%	
	Southeast	30.7%	
	Other	43.5%	
	b. Urban	28.4%	
	Rural	55.6%	
	Metro-Atlanta	16.0%	
6.	Average Number of Schools Applied to	2.93	
	Mean Rank of Georgia Tech	1.76	
	Mean Number of Acceptances	2.29	
7.	Students' Decision about Major:		
	Certain	47.8%	
	Probable	43.0%	
	Undecided	9.1%	
8.	May/June, 1974 High School Graduation	96.4%	
9.	August/September, 1974 College Entrance	93.4%	
10.	Average Number of items Omitted	0.74	
11.	Students Who Have Decided to Attend Georgia Tech	520	
	a. Percentage of Entire Sample	32.4%	
	b. Selected Majors:		
	Math-Science	13.3%	
	Engineering	56.7%	
	Industrial Management	4.8%	
	Architecture	12.3%	
	Other	3.7%	

APPENDIX IV (Continued)

c.	Percentage Women	16.5%
d.	Percentage Men	83.5%
e.	Ranking of Tech	
	First Choice	87.7%
	Second Choice	10.9%
	Third Choice	1.3%
	Fourth Choice	0.1%
	Fifth Choice	0.0%
f.	First Choice Schools	
	Georgia Institute of Technology	87.7%
	Massachusetts Institute of Technology	2.8%
	U. S. Naval Academy	1.1%
	U. S. Air Force Academy	0.9%
	Vanderbilt	0.5%

APPENDIX V

CORRELATIONS BETWEEN VALENCE AND INSTRUMENTALITY VALUES

<u>Variables</u>	<u>All Students</u>			<u>Tech Definites</u>			<u>Non-Tech Definites</u>		
	r_{VI_T}	r_{VI_O}	$r_{I_T I_O}$	r_{VI_T}	r_{VI_O}	$r_{I_T I_O}$	r_{VI_T}	r_{VI_O}	$r_{I_T I_O}$
1. Prestige	.40	.34	.20	.55	.30	.37	.28	.46	.22
2. High-valued degree	.40	.37	.25	.59	.31	.40	.30	.51	.33
3. Probability of graduating	.40	.47	.70	.48	.48	.71	.35	.47	.70
4. Intellectual atmosphere	.46	.47	.36	.63	.42	.44	.35	.56	.39
5. Coop program	.40	.32	.39	.53	.26	.46	.30	.38	.34
6. Mature into an adult	.54	.58	.63	.66	.53	.72	.47	.62	.64
7. Contribute to community	.51	.53	.64	.59	.47	.66	.45	.58	.65
8. Make personal friends	.45	.53	.61	.55	.48	.68	.38	.56	.60
9. Meet opposite sex	.27	.42	.29	.32	.37	.29	.23	.46	.30
10. Make professional contacts	.49	.43	.53	.62	.45	.60	.38	.47	.55
11. Value of friends' opinion	.27	.25	.39	.30	.26	.49	.23	.27	.40
12. Value of parents' opinion	.28	.27	.37	.35	.23	.48	.22	.36	.47
13. Value of teachers' opinion	.31	.21	.47	.36	.21	.59	.24	.27	.48

APPENDIX V (Continued)

Variables	All Students			Tech Definities			Non-Tech Definities		
	r_{VI_F}	r_{VI_O}	$r_{I_T I_O}$	r_{VI_T}	r_{VI_O}	$r_{I_T I_O}$	r_{VI_T}	r_{VI_O}	$r_{I_T I_O}$
14. Grow culturally	.39	.50	.53	.53	.47	.60	.28	.51	.48
15. Access to sports	.26	.33	.26	.29	.25	.30	.14	.40	.23
16. Recreation	.50	.53	.63	.59	.49	.68	.43	.58	.63
17. Friends start at same time	.34	.30	.26	.50	.20	.23	.18	.37	.27
18. Friends now at school	.33	.37	.42	.48	.33	.50	.20	.41	.41
19. Desirable location	.25	.26	.03	.52	.13	.09	.09	.39	.14
20. Convenient location	.29	.28	.07	.56	.10	.09	.04	.44	.09
21. Low tuition and living costs	.21	.26	.10	.37	.10	.12	.08	.37	.08
22. Financial Aid	.25	.37	.57	.40	.30	.68	.12	.42	.54
23. Time for social life	.26	.45	.36	.46	.36	.42	.15	.50	.34
F	.36	.38	.39	.49	.33	.46	.26	.45	.40
N	714	714	714	315	315	315	399	399	399

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